## (12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

## (19) World Intellectual Property Organization

International Bureau





(43) International Publication Date 22 April 2004 (22.04.2004)

**PCT** 

(10) International Publication Number WO 2004/033668 A2

(51) International Patent Classification<sup>7</sup>:

C12N

(21) International Application Number:

PCT/US2003/032819

(22) International Filing Date: 10 October 2003 (10.10.2003)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/418,467 60/471,423 10 October 2002 (10.10.2002) US 16 May 2003 (16.05.2003) US

(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier applications:

US

60/471,423 (CIP)

Filed on

16 May 2003 (16.05.2003) 60/418,467 (CIP)

US Filed on

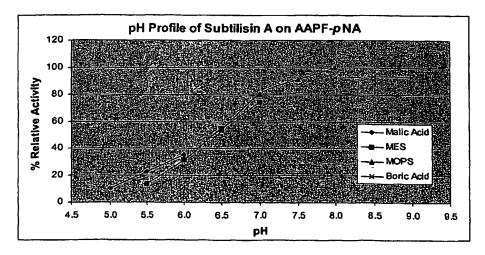
10 October 2002 (10.10.2002)

(71) Applicant (for all designated States except US): DI-VERSA CORPORATION [US/US]; 4955 Directors Place, San Diego, CA 92121-1609 (US). (72) Inventors; and

- (75) Inventors/Applicants (for US only): CAYOUETTE, Michelle [US/US]; 4803 Bancroft Street, San Diego, CA 92116 (US). HANSEN, Connie, Jo [US/US]; 3645 Gayle Street, San Diego, CA 92115 (US). MCCLURE, Amy [US/US]; 4738 Kansas Street, San Diego, CA 92116 (US). SUN, May [US/US]; 15884 Camino Codorniz, San Diego, CA 92127 (US). GRAMATIKOVA, Svetlana [US/US]; 5709 Erlanger, San Diego, CA 92122 (US). DYCAICO, Mark [US/US]; 14208 La Trucha Street, San Diego, CA 92129 (US). BARTON, Nelson [US/US]; 10928 Sunset Ridge Dr., San Diego, CA 92131 (US). STEGE, Justin [US/US]; 6931 Worchester Place, San Diego, CA 92126 (US). ABOUSHADI, Nahla [EG/US]; 3359 Elmwood Way, San Marcos, CA 92069 (US).
- (74) Agent: EINHORN, Gregory, P.; Fish & Richardson P.C., 12390 El Camino Real, San Diego, CA 92130 (US).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,

[Continued on next page]

(54) Title: PROTEASES, NUCLEIC ACIDS ENCODING THEM AND METHODS FOR MAKING AND USING THEM



(57) Abstract: The invention is directed to polypeptides having protease activity, polynucleotides encoding the polypeptides, and methods for making and using these polynucleotides and polypeptides. The polypeptides of the invention can be used in a variety of diagnostic, therapeutic, and industrial contexts. The polypeptides of the invention can be used as, e.g., an additive for a detergent, for processing foods and for chemical synthesis utilizing a reverse reaction. Additionally, the polypeptides of the invention can be used in food processing, brewing, bath additives, alcohol production, peptide synthesis, enantioselectivity, hide preparation in the leather industry, waste management and animal degradation, silver recovery in the photographic industry, medical treatment, silk degumming, biofilm degradation, biomass conversion to ethanol diodefense, antimicrobial agents and disinfectants, personal care and cosmetics, biotech reagents, in increasing starch yield from corn wet milling and pharmaceuticals such as digestive aids and anti-inflammatory (anti-phlogistic) agents.

